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10/568,786	02/16/2006	Shiro Uchida	09792909-6622	6377

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EXAMINER

NIU, XINNING

ART UNIT

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary****Application No.**

10/568,786

**Applicant(s)**

UCHIDA ET AL.

**Examiner**

XNNING NIU

**Art Unit**

2828

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 January 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)
- 3) ☐ Information Disclosure Statement(s) (PTO/SG/US)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 3-12, 15-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyake (JP 11-251678).
3. Regarding claim 3, Miyake discloses: a substrate (2) ([0009]); a first conductive type first cladding layer (4) formed on said substrate ([0009]); an active layer (5) formed on said first cladding layer ([0009]); a second conductive type second cladding layer (8,9) formed on said active layer, a part thereof having a ridge-shaped portion as a current narrowing structure ([0009]). Miyake does not disclose: first ridge shaped layer and second ridge shaped layer are a layer with a relatively high aluminum concentration ratio and a layer with a relatively low aluminum composition ratio, respectively; said ridge shaped portion of said second cladding layer includes a first ridge shaped layer on the side close to said active layer and having a high bandgap and a second ridge shaped layer on the side distant from the active layer and having a low bandgap; composition ratio  $X_1$  of said first ridge shaped layer is between 0.6 and 0.7, and an aluminum composition ratio of  $X_2$  of said second ridge shaped layer is  $X_2 \leq X_1$ . It

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would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the aluminum composition of each layer, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. Since bandgap is directly proportional to the aluminum concentration in AlGaInP a layer with a high aluminum concentration would have a higher bandgap and a layer with a lower aluminum concentration would have a lower bandgap.

4. Regarding claim 4, see the rejection for claim 3.
5. Regarding claim 5, Miyake discloses the claimed limitations except a film thickness of said first ridge shaped layer is 50 to 400 nm. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the thickness of the first ridge shaped layer, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.
6. Regarding claim 6, Miyake discloses the claimed limitations except a sum of a film thickness of a portion excepting said ridge-shaped portion of said second cladding layer and a film thickness of said first ridge shaped layer is 750 nm or smaller. It would

have been obvious to one having ordinary skill in the art at the time the invention was made to modify the thickness of the first ridge shaped layer and other layers below it, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

7. Regarding claim 7, Miyake discloses: etch stop layer (7) formed on a boundary face of a portion excepting the ridge shaped portion of said second cladding layer and said first ridge shaped layer ([0009]).

8. Regarding claim 8, Miyake discloses: first cladding layer, active layer and second cladding layer comprise AlGaInP based material (Figure 1, [0009]).

9. Regarding claim 9, Miyake discloses the claimed limitations except: wherein the first cladding layer, active layer and second cladding layer are formed by an AlGaN based material. It would have been obvious to one having ordinary skill in the art at the time the invention was made to AlGaN instead of AlGaInP, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

10. Regarding claim 10, Miyake discloses the claimed limitations except: wherein the first ridge shaped layer comprise a layer having an equal refractive index to that of a portion excepting said ridge shaped portion of said second cladding layer. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the refractive index of the ridge layer in order to control the lateral mode of the laser device.

11. Regarding claim 11, Miyake discloses the claimed limitations except: wherein the first ridge shaped layer comprise a layer having an lower refractive index to that of a portion excepting said ridge shaped portion of said second cladding layer. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the refractive index of the ridge layer in order to control the lateral mode of the laser device.

12. Regarding claim 12, Miyake discloses the claimed limitations except: wherein an aluminum composition ratio of said portion excepting said ridge-shaped portion of said second cladding layer is 0.68, and an aluminum composition ratio of said first ridge-shaped layer is 0.75 to 0.80. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the aluminum concentration of the two ridge layers, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the

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optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

13. Regarding claim 15, please see the rejection for claim 3.
14. Regarding claim 16, please see the rejection for claim 4.
15. Regarding claim 17, please see the rejection for claim 5.
16. Regarding claim 18, please see the rejection for claim 6.
17. Regarding claim 19, please see the rejection for claim 7.
18. Regarding claim 20, Miyake discloses: forming ridge shaped portion by etching which stops at said etching stop layer ([0013]).
19. Regarding claim 21, please see the rejection for claim 8.
20. Regarding claim 22, please see the rejection for claim 9.
21. Regarding claim 23, please see the rejection for claim 10.

22. Regarding claim 24, please see the rejection for claim 11.
23. Regarding claim 25, please see the rejection for claim 12.

### ***Response to Arguments***

24. Applicant's arguments filed 01/18/2008 have been fully considered but they are not persuasive. The examiner believes that modifying the aluminum concentration of the ridge layer is obvious to one of ordinary skill in the art as evidenced by Nagai (5,892,785) which discloses: second upper cladding layer (26) of a ridge waveguide laser with aluminum composition of 0.7 (Figure 6, Col 10, Lines 13-54). One of ordinary skill in the art at the time the invention was made would know to modify the aluminum concentration in a layer because the aluminum concentration is directly proportional to the bandgap energy. Thus by modifying the aluminum concentration it is possible to modify the bandgap and therefore modify the confinement of carriers in the cladding region (confinement of carriers is related to the bandgap energy).

### ***Conclusion***

25. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not



mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to XNNING NIU whose telephone number is (571)270-1437. The examiner can normally be reached on M-T, 7:30-5:00 EST, Alternate Fridays 7:30-4:00 ES.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Min Sun Harvey can be reached on (571) 272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Xinning Niu/

05/06/2008

/Minsun Harvey/

Supervisory Patent Examiner, Art Unit 2828